1.Complete these sentences about the **Periodicity. Use the words in the box:**

proton, group, giant molecular, repeat, periods, increases, periodic trends, giant metallic, remains the same, closer, negative, decrease, outermost, smaller, remove, harder, attraction, ionic compounds, increases, shielding, giant molecular, close, falls off, simple molecular, increases, greater, decrease, non-metal oxides, basic compounds

_____(1)in the Periodic Table are rows of elements whose _____(2)electrons are in the same principal quantum shell. The atoms of neighboring members differ by one ____(3)and one electron. As atomic number increases, the properties of the elements show trends which ____(4)themselves in each Period of the Periodic Table. These trends are known as____ ____(5). A column of elements thus arranged is called a_____(6).

Atomic radii _____(7)across a period due to increasing nuclear charge. This means electrons are pulled _____(8) to the nucleus, making the atomic radius_____(9).

_____(10)ions are much smaller than their atoms. _____(11)ions are slightly larger than their atoms.

The first ionisation energy of an element is the energy required to _____(12)one electron from each of a mole of free gaseous atoms of that element. A high ionization energy means there is a high _____(13)between the electron and the nucleus and so more energy is needed to remove the electron. The greater the number of protons, the _____(14)the attraction of the electrons to the nucleus and the ____(15) it is to remove the electrons. Attraction ____ ___(16) very rapidly with distance. An electron ____(17) to the nucleus will be much more strongly attracted than one further away. As the number of electrons between the outer electrons and the nucleus____(18), the outer electrons feel less attraction towards the nuclear charge. This lessening of the pull of the nucleus by inner shells of electrons is called_____(19). The first ionisation energy _____(20)across a period because the nuclear charge increases but the shielding___ ___ ___(21).

Electronegativity _____(22) across period due to increasing number of outer electrons.

Across a period, the structures of the elements change from___ ___(23), through ____ ____(24)to____ ____(25). Group 18 elements consist of individual atoms. There is a gradual _____(26) in metallic character in crossing a period. Electrical conductivity _____(27)from sodium to aluminium as the number of delocalized electrons per atom increases.

Across a period, the oxides of Period 3 elements change from ____ ____(28)with ionic bonding through to ____ ____(29)in the centre of the period (Group 14) with silicon, going on to acidic covalently bonded simple molecules of the____ ____(30). Aluminium oxide (in Group 13) is_____(31), exhibiting both basic and acidic behavior. Across a period, the chlorides of Period 3 elements change from ____ ____(32)that dissolve in water to ____ ____(33) that are hydrolyzed by water, releasing fumes of hydrogen chloride and leaving an acidic solution.

2.Complete the tables about properties of period 3 elements using words: decreases, decreases, zero and others

Properties	Na	Mg	Al	Si	P (white)	S	Cl	Ar
Atomic size								
First ionization energy								
Electronegativity								
Melting and boiling point								
Electrical conductivity								
Bonding								-

3. Are these statements about Periodicity <u>True</u> or <u>False</u>?

№	Statements	True / False
1	Periods in the Periodic Table are rows of elements whose outermost electrons are in the same principal quantum shell.	
2	The atoms of neighbouring members differ by one neutron and one electron	
3	First ionisation energies tend to decrease across a period.	
4	Atomic radii decrease across a period due to decreasing nuclear charge	
5	Positive ions are much smaller than their atoms.	
6	Across a period, the structures of the elements change from individual atoms, through giant molecular to simple molecular.	
7	Across a period, the chlorides of Period 3 elements change from ionic compounds that dissolve in water to covalent compounds that are hydrolysed by water, releasing fumes of hydrogen chloride and leaving an acidic solution	
8	A column of elements thus arranged is called a row.	
9	There is a gradual decrease in metallic character in crossing a period	
10	Electronegativity increases across the period	
11	Melting and boiling point decreases from Al to Si	
12	Melting and boiling point increases from P to S	
13	Electrical conductivity is zero from Si to Ar	
14	Electrical conductivity decreases from Na to Al	

4. Read the clues and complete the crossword:

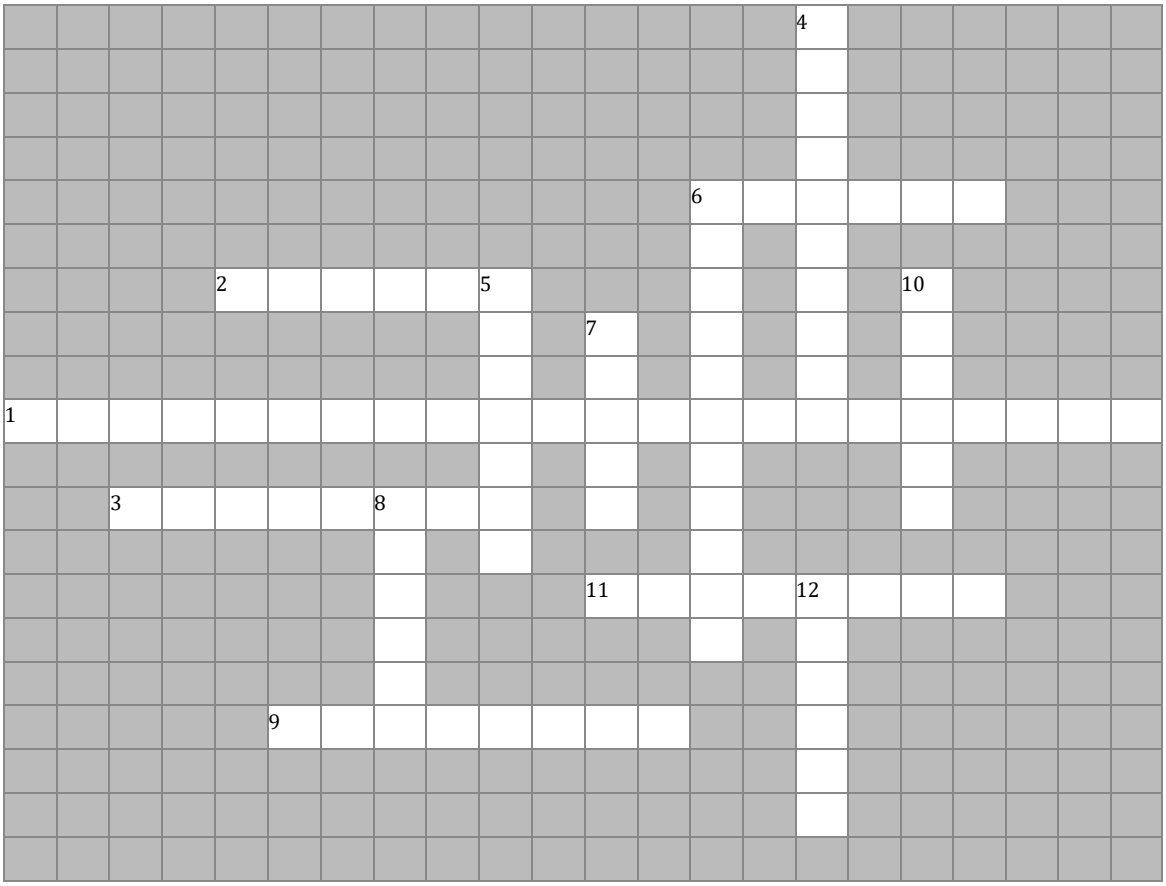
Across (→):

1. ……increases from sodium to aluminium as the number of delocalized electrons per atom increases (2 words)
2. …a period, the structures of the elements change from giant metallic, through giant molecular to simple molecular
3. ionisation energies tend to…. across a period
6. The atoms of neighbouring members differ by one… and one electron (and usually by one or more neutrons)

9. Atomic radii…. across a period due to increasing nuclear charge
11. There is a gradual decrease in …… character in crossing a period

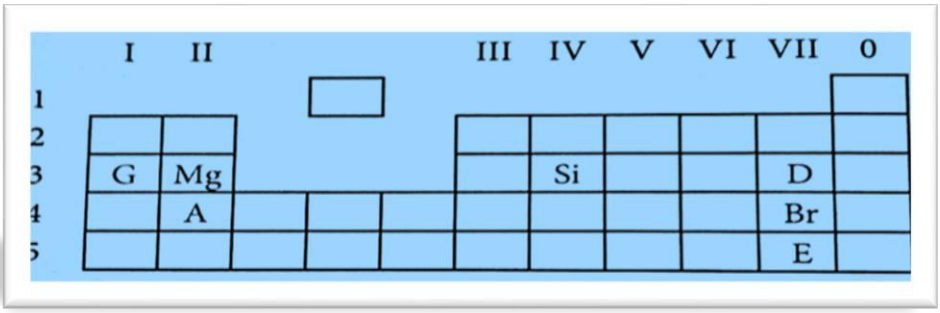
Down (↓):

4. Compounds that can act as both acids and bases
5. Positive ions are much ……than their atoms.
6. the repeating patterns in the physical and chemical properties of the elements across the periods of the Periodic Table.
7. A column of elements
8. …… size– decreases across the period
10. row of elements whose outermost electrons are in the same principal quantum shell
12. Negative ions are slightly…..than their atoms



5. Structured exam question

Below is an outline of a part of the periodic table with magnesium [Mg], silicon [Si] and bromine [Br] in their correct positions. Letters represent the positions of four other elements. When answering the following questions, use these letters as the symbols of the elements. You are not expected to identify the elements.



a) i) Give the symbols of TWO elements that are in the same group.

_____**[1]**

ii) Element **W** has an electronic configuration of 2.8.6. Place **W** in its correct position in the table above.

[1]

iii) Give the electronic configuration of **Si** and name the element.

Electronic configuration: _____ Name: _____ [2]

b) i) Both magnesium and **A** react with water. Which element would you expect to react more vigorously? Provide an explanation for your answer.

Element: _____

Explanation:

_____

_____ [3]

ii) Write a balanced chemical equation for the reaction between magnesium and water.

_____[2]

iii) Apart from its reaction with water, state TWO other reactions that are typical of **A**.

_____[2]

c) i) Elements **G** and **D** are both in Period 3. What can you deduce about the electronic structure of their atoms?

_____[1]

ii) Draw lines to show how EACH element shown in Period 3 would be classified. [2]

D	**metal**
G	**semi-metal**
Mg	**non-metal**
Si	

iii) State THREE ways in which magnesium and **D** differ in their physical properties.

1. _____

2. _____

3. _____

[3]

iv) Both **G** and magnesium react with hydrochloric acid. Which is element would you expect to react more vigorously? Provide an explanation for your answer.

Element: _____

Explanation: _____

_____

_____[3]

v) Write a balanced chemical equation for the reaction between magnesium and hydrochloric acid.